Early Journal Content on JSTOR, Free to Anyone in the World

This article is one of nearly 500,000 scholarly works digitized and made freely available to everyone in the world by JSTOR.

Known as the Early Journal Content, this set of works include research articles, news, letters, and other writings published in more than 200 of the oldest leading academic journals. The works date from the mid-seventeenth to the early twentieth centuries.

We encourage people to read and share the Early Journal Content openly and to tell others that this resource exists. People may post this content online or redistribute in any way for non-commercial purposes.

Read more about Early Journal Content at http://about.jstor.org/participate-jstor/individuals/early-journal-content.

JSTOR is a digital library of academic journals, books, and primary source objects. JSTOR helps people discover, use, and build upon a wide range of content through a powerful research and teaching platform, and preserves this content for future generations. JSTOR is part of ITHAKA, a not-for-profit organization that also includes Ithaka S+R and Portico. For more information about JSTOR, please contact support@jstor.org.

On p. 62 the "Knight-Darwin law" that "nature abhors perpetual self-fertilization" is amended to read, "nature resists any sudden change in long-established conditions." A suggestion having the same import was made some years ago by HAYS,[5] but this seems to have been overlooked by Dr. EAST. HAYS says, "possibly DARWIN'S law would more broadly cover the truth if expressed thus: nature abhors a radical change which would require species to cross in much closer or in much more radical relationship than is their long-established habit."

The last ten pages preceding the summary discuss the technique of maize breeding, giving an insight into the great complexity of the problems to be solved in breeding this crop, owing to the occurrence of fluctuations and numerous elementary species, and the injurious effects of too close inbreeding. The author's experience in maize breeding, as an associate of HOPKINS at the Illinois Station, and his continued efforts along similar lines at the Connecticut Station, have thoroughly qualified him to write on this subject, and his discussion will doubtless prove of great value to maize breeders; but the reviewer questions the correctness of the assumption that the isolation of pure strains of maize is the proper aim of those who would secure the greatest possible improvement in this crop.

It is believed that this excellent bulletin will have such a reception that other stations will follow Dr. EAST'S example in disseminating advanced scientific information.—G. H. SHULL.

The latent life of seeds.—Two rival doctrines have been used heretofore, with equal success, to account for the latent life of seeds. The one holds that life is completely suspended, all the exchanges, both of matter and of energy, being arrested. The other holds that the phenomena of metabolism are greatly diminished, but that they are never entirely suppressed. Both of these theories have been supported by experimental evidence, and the question has called forth a very large number of investigations. These antagonistic views have led BECQUEREL to a further study,[6] with the idea that the previous conflicting results depended upon neglected properties of the integuments. He has demonstrated the impermeability for gases of the integuments of seeds of a considerable number of species; and it seems GOLA[7] simultaneously had discovered impermeability for water to be a common character.

These facts make it necessary to go over previous experiments, perforating the integuments or removing them. Seeds which resist the action of alcohol, ether, and chloroform, when their integuments are intact, succumb when these agents are brought into actual contact with the embryo. But low temperatures, even to −210°, do not have any appreciable effect on germination if the protoplasm has already undergone thorough desiccation. The existence of gaseous exchanges, heretofore attributed to respiration, was confirmed. But it is clearly shown that the fixation of oxygen and the evolution of CO_2 have no relation to the life of the seed, and that a direct oxidation probably takes place with equal activity in live and dead seeds. Thus the gaseous exchanges of the integuments, compared with those of the decorticated seeds from which theycame, were frequently, weight for weight, very much larger. Further, these exchanges in the isolated integuments, compared with those of the entire seeds of the same species whose integuments are impermeable, are absolutely the same. Where the integument is permeable, however, the gaseous exchanges of the embryo are added to those of the integuments. None of these changes take place unless the air is moist and the protoplasm contains still a certain proportion of water.

---

[5] HAYS, W. M., Plant breeding. U. S. Division of Physiology and Pathology, Bull. No. 29. pp. 72. *figs. 21.* 1901. (See pp. 38, 39.)

[6] BECQUEREL, PAUL, Recherches sur la vie latente de graines. Ann. Sci. Nat. Bot. IX. 5:193–320. 1907.

[7] As cited by BECQUEREL: GOLA, J., Mémoire sur la physiologie [in another place, Recherches sur] des téguments des graines. Acad. [Sci.] Turin. 1905.

BECQUEREL has also shown that no perceptible gaseous exchanges take place in the embryo when completely dehydrated, and that it can bear for a long time an atmosphere of carbonic acid, nitrogen, or a complete vacuum without losing its power to germinate. In fact, he is convinced that the loss of germinative power is dependent upon the changes permitted by the hygroscopicity of the seeds, and the only ones in which longevity is to be looked for are those with an impermeable integument.

Incidentally he discusses the longevity of seeds *in extenso*, and himself made experiments upon almost 500 species, belonging to 30 of the most important families of monocots and dicots, whose age was accurately known from the records of the *Musêum d'Histoire Naturelle* of Paris. Only four families had any viable seeds. Eighteen species of Leguminosae (87 to 28 years old), three species of Nelumbium (56 to 18 years), one Lavatera (64 years), and a Stachys (77 years) germinated.

BECQUEREL seems to have reduced the question to this dilemma: since there is no appreciable metabolism for as much as two years' time, in perfectly dry yet viable seeds, either their life-processes are wholly anaerobic, intracellular, and very slow, or life is completely suspended. He has begun an experiment of ten years' duration to determine whether the dried protoplasm is stable in a vacuum as perfect as can be obtained. He has inclosed in exhausted vials dry seeds of buckwheat and of wheat, with perforated integuments. These vials will be kept in darkness and will be examined with a spectroscope for gases every year, and at the end of ten years the seeds will be planted. This experiment promises to be a crucial one, if (as is to be expected) no gases are set free, and the seeds live. If it turns out otherwise, the choice between retarded life or suspended life for seeds will remain a speculative one.—C. R. B.

Apogamy and apospory in ferns.—HELENE WORONIN,[8] working in GOEBEL'S laboratory, has published the results of an experimental study on apogamy and apospory in ferns. The study included six species; *Trichomanes Kraussii*, *Pellaea flavens*, *P. nivea*, *P. tenera*, *Notochlaena Eckloniana*, and *N. sinuata.*

---

[8] WORONIN, HELENE, Apogamie und Aposporie bei einigen Farnen. Flora **98**: 101–162. *figs. 72.* 1907.